



The Meyer Sound USM-1 is a high-powered, wide coverage loudspeaker for professional stage monitoring applications. Specifically designed for touring reinforcement, the accurate, rugged USM-1 is a biamplified system consisting of a proprietary 15-inch low-frequency driver in a vented enclosure, and a 70-degree high-frequency horn with a 2-inch (throat diameter) driver.

The USM-1 is designed to be operated as a system with the Meyer Sound S-1 Control Electronics Unit (one S-1 per channel). The S-1 comprises electronic crossover, Meyer Sound exclusive SpeakerSense™ driver protection circuitry, and amplitude and phase response alignment circuitry optimized for the loudspeaker.

### Amplifier Requirements

The USM-1 requires a professional quality two-channel power amplifier rated at 300 watts per channel minimum (and not exceeding 1000 watts per channel) continuous into 8 ohms. (If two USM-1's are to be operated in parallel from the amplifier, it should be capable of driving 4 ohms.) Using amplifiers of lower power will not allow the full power and headroom of the USM-1 to be realized, though this may be acceptable in applications

where high pressure levels are not required. Conversely, use of amplifiers rated at significantly more than 1000 watts per channel may endanger the loudspeaker, and **is not recommended**.

For further information on power amplifiers, please refer to **Choosing a Power Amplifier**, a Meyer Sound Technical Note available from your dealer.

### Connections

The USM-1 is a biamplified system and **must** be used with the **S-1 Control Electronics Unit**. The S-1 functions as an active crossover, dividing the input signal into high- and low-frequency components.

The connection terminals of the low- and high-frequency drivers appear on a single Cannon P-type 4-pin connector located on the rear of the USM-1 cabinet. The pin assignments for this connector are:

- Pin 1 — 15-inch driver, hot
- Pin 2 — 15-inch driver, common
- Pin 3 — horn driver, common
- Pin 4 — horn driver, hot

(When the cabinet is fitted with a Cannon EP-5 connector, Pin 5 is unconnected)

The minimum wire size for connections between the USM-1 and the power amplifier is 14 gauge.

**Note.** If you are using standard Meyer Sound loudspeaker cables and adapters, simply connect the female end of the loudspeaker cable to the USM-1, the male end of the cable to the Meyer Sound pigtail adapter, and the banana connectors of the adapter to your amplifier outputs. In making connections between the USM-1 and the amplifier, be sure to connect the 15-inch driver to the **Lo** channel, and the horn driver to the **Hi** channel.

The adapter banana plugs are color-coded as follows:

- Red** — Low frequency driver
- Black** — High frequency driver

For connections between the S-1 and the power amplifier, refer to the **S-1 Operating Instructions**.

### Verifying System Polarity

All Meyer Sound loudspeakers are thoroughly tested in all stages of manufacture, and correct polarity of individual cabinets is assured. However, accidental polarity reversal is possible when there are multiple amplifier connections. A cabinet which is out of polarity with the rest of the system will cause severe cancellation, resulting in a noticeable decrease in SPL and possible component damage.

Because of the extensive signal processing circuitry of the S-1 Control Electronics Unit, the "phase-popper" type of speaker checkers cannot reliably be used to test for correct polarity of the low and high drivers of the USM-1. However, because the USM-1 is phase corrected through crossover, any of the portable spectrum analyzers can be used, with a pink noise source, to test for driver polarity as follows:

**1. Single Cabinets.** First, verify polarity of the woofer by connecting a 9-volt battery at the end of the loudspeaker cable.

#### Cannon connector

- Pin 1
- Pin 2

#### Battery

- + terminal
- terminal

- The woofer cone should move outward toward the listener. Connect the speaker cable to the amplifier.
- Input the pink noise source to the S-1 and advance the S-1 input **Level** control to a convenient measuring level.
- Standing in front of the loudspeaker, position the analyzer microphone directly between the horn and the 15-inch driver, at right angles to the cabinet face, and about twenty inches in front of the USM-1.
- If polarity of the horn driver is reversed, a trough will appear in the response curve at around 900 Hz. If in doubt, reverse the polarity of the **Hi** amplifier output while you watch the display.

**2. Multiple Cabinets.** Each cabinet should first be tested as above.

- Connect **one** loudspeaker and advance the pink noise to a convenient measuring level. Position the measuring microphone between the two adjacent loudspeakers, and about six feet distant. Note the frequency response and overall level.
- Leaving the first loudspeaker connected, con-

nect the adjacent one and observe the analyzer display. The entire curve should jump up in level, indicating correct addition between the loudspeakers. If the loudspeakers are adjacent, a polarity reversal between them will show up as severe broadband cancellation.

As the loudspeakers are moved apart, the cancellation will become less apparent at high frequencies. For this reason polarity testing should be done with cabinets adjacent.

### Placement of the USM-1

When the USM-1 is placed on the floor in its normal position (horn facing up towards the performer), there will be a boost in the low frequency response of the loudspeaker. This is caused by the loudspeaker coupling with the floor, and may be

corrected at the S-1 Control Electronics Unit by switching in the Lo Cut filter on the Preset Panel, if desired. Please refer to the **S-1 Operating Instructions** for a complete description of its functions.

### Rigging

The USM-1 loudspeaker has four steel rigging brackets internally mounted as an integral part of the cabinet design, and the cabinet is supplied with aircraft pan fittings (ring and stud), or  $\frac{3}{8}$ "-16 or M10 x 1.5 nut plates, according to user preference. A flat plate is supplied when no rigging hardware is specified. All three plate types are held in place by six Phillips-head machine screws and can be interchanged at any time. **The handles on the USM-1 cabinet are provided for moving and carrying the loudspeaker and are not to be used for rigging purposes.**

The rigging hardware is designed so that a single point can support the normal load for the cabinet. In the case of the USM-1, the recommended maximum load is 420 lbs. (190 kg). Any of the individual rigging points is capable of supporting this load with an adequate safety margin. However, Meyer Sound strongly recommends that safety lines be run to the other points. If the structural integrity of any cabinet has been compromised by damage or negligence, then the safety of the rigging cannot be assured. **All rigging should be done by competent professionals.**

### Specifications

#### Acoustical - USM-1/S-1 System

Frequency response <sup>1</sup>	40-18k Hz $\pm$ 4 dB
Maximum SPL <sup>2</sup>	
Continuous	130 dB
Peak	139 dB
HF Distribution Pattern	
Horizontal	70 degrees
Vertical	60 degrees

#### USM-1 Loudspeaker

Driver Complement	
Low Frequency Driver	MS-15
High Frequency Driver	MS 2001A
High Frequency Horn	70 degree modified radical
HF DC Protection	20 $\mu$ F Polypropylene capacitor
Enclosure	2.3 cu. ft. vented, multi-ply Finnish birch plywood
Finish	Black textured
Physical Dimensions <sup>3</sup>	21" W x 21.5" H x 18" D
Weight	82 lbs. (37.3 kg)
Protective Grill	Hex perforated metal, powder coated, charcoal-grey foam covering
Connector	Cannon EP-4 (male) EP-5 (male, Europe only)
Rigging (optional)	Aircraft pan fittings, or M10 x 1.5 or 3/8"-16 nut plate

#### Notes:

1. Measured 1 meter on-axis to high horn, half-space conditions, pink noise input, in third octave bands.
2. Loudspeaker driven with "A" weighted noise (peak-to-RMS ratio  $\approx$  12dB), with amplifier rated at 300 W/channel at 8 ohms. The USM-1 will accommodate amplifiers capable of output levels up to  $\pm$ 140vpk.
3. Refer to "**USM-1 Overall Dimensions**" for detailed dimensions. (Available from Meyer Sound Labs. Inc.)